In the middle of September it will have attained the value at which observations have been already made.

This comet was first observed by Méchain on January 9, 1790. It was rediscovered by Mr. Tuttle at Cambridge, U.S., on September 5, 1858: from the observations made in this year its period was ascertained to be about 13·8 years, so that the comet had completed five revolutions since it was found by Méchain, without having been perceived. According to Clausen's calculations it was in perihelion on the following dates:—1803, November 7; 1817, May 18; 1830, December 6; and 1844, June 28. It approaches nearest to the orbit of Jupiter in heliocentric longitude 264°, or at a true anomaly of about 144°, when its distance from the planet's orbit is 0·8. At the comet's last passage through this point in July, 1873, the distance from Jupiter was as great as 8·9.

Subjoined are the elements of the orbit for 1871, expressed as usual in the catalogues, and with a slight correction to the predicted time of perihelion passage, which the observations showed to be required:—

Perihelion passage, 1871, December 1·7974 G.M.T.

	° ′ ″	
Longitude of perihelion	116 4 36	Mean Equinox, 1870
,, ascending node ...	269 17 12	
Inclination	54 17 0	
Eccentricity	0·8210540	
Log. perihelion distance	0·0128823	
,, semi-axis major	0·7601603	

The corresponding period of revolution is 5044·7 days, or 13·812 years.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, *MAY* 10-16

(For the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on May 10

Sun rises, 4h. 18m.; souths, 11h. 56m. 12·1s.; sets, 19h. 35m.; decl. on meridian, 17° 44′ N.: Sidereal Time at Sunset, 10h. 50m.

Moon (New on May 14) rises, 2h. 28m.; souths, 8h. 24m.; sets, 14h. 31m.; decl. on meridian, 1° 30′ S.

Planet	Rises	Souths	Sets	Decl. on meridian
	h. m.	h. m.	h. m.	° ′
Mercury	3 55	10 51	17 47	10 7 N.
Venus	4 25	12 3	19 41	17 38 N.
Mars	3 42	10 44	17 46	11 23 N.
Jupiter	11 25	18 41	1 57*	13 49 N.
Saturn	6 7	14 15	22 23	22 15 N.

* Indicates that the setting is that of the following day.

Occultations of Stars by the Moon

May	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image	
			h. m.	h. m.	°	°
11	44 Piscium	6	3 27	near approach	160	—
16	130 Tauri	6	18 31	19 27	137	298

Phenomena of Jupiter's Satellites

May	h. m.		May	h. m.	
10	20 46	II. occ. disap.	14	19 46	I. tr. ing.
13	1 17	I. tr. ing.		22 6	I. tr. egr.
	21 58	IV. occ. disap.	15	20 27	I. ecl. reap.
	22 25	I. occ. disap.			
	22 35	III. ecl. reap.			

The Occultations of Stars and Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

May	h.	
10	10	Mercury stationary.
11	9	Mercury at greatest distance from the Sun.
13	4	Mercury in conjunction with and 0° 21′ south of the Moon.
13	4	Mars in conjunction with and 2° 4′ north of the Moon.
13	9	Mercury in conjunction with and 2° 27′ south of Mars.
14	18	Venus in conjunction with and 3° 47′ north of the Moon.
16	15	Saturn in conjunction with and 4° 2′ north of the Moon.

GEOGRAPHICAL NOTES

We regret to learn that the well-known African explorer, Dr. Gustav Nachtigal, died on April 24, on board the German gunboat *Möwe*, off the west coast of Africa. Dr. Nachtigal was born at Eichstadt in 1834, and was trained to the medical profession. In 1862 he went to Algiers on account of his health, and in 1868 he started on his memorable journey into the heart of Africa, visiting the territories of Bornu, Baghirmi, Wadai, Darfur, Kordofan, emerging at Khartoum in 1874. This work placed Dr. Nachtigal in the front rank of African explorers. At the time of his death, it is well known, he was looking after the interests of Germany in connection with its recent annexations in West Africa.

The death is announced from Königsberg of Dr. Karl Zöppritz, Professor of Geography in the University there, and well known as the author of the reports on the progress of geophysics and of African exploration in Behm-Wagner's Geographical Year-Book.

On Monday last a lecture was delivered at the Alexandra Palace by Prof. A. H. Keane, on "The Lapps: their Origin, Type, Affinities, Social Usages," in connection with the company of Lapps who have recently arrived in London and pitched their tents on the slopes of Muswell Hill for the summer months. The group consists of seven persons, mostly members of one family, from the Karasjok district in Finmark, Norway, and belongs to the "mountain" or nomad division of the race. As these "Mountain Finns," as the Norwegians call them, are of much purer descent than the "River" and "Sea" Lapps, who have given up their nomad life and now reside in settled communities either along the riverain tracts or on the sea coast, they afford ethnologists a favourable opportunity of studying the type of these primitive inhabitants of the Arctic regions of North-West Europe. They are accompanied by six reindeer, and two native dogs used for tending the herds, and have also brought with them specimens of the three kinds of sledges still in use, and some of the famous snow-shoes with which they travel with such surprising velocity over the frozen surface of the ground. The average height appears to be about five feet (extremes, 4·10 to 5·4 in.); but in some other respects the type seems to have deviated considerably from the Mongolic, to which it fundamentally belongs, and has been assimilated, especially in the colour of the hair and eyes, in the complexion and shape of the nose, to the surrounding Norse populations. But the lecturer seemed disposed to attribute this assimilation rather to like climatic influences than to actual intermixture, of which there is no direct evidence.

At the last meeting of the Geographical Society of Paris, M. Thouar described in detail the observations made by him during his recent journey in search of the remains of the unfortunate Crévaux expedition in the Northern Chaco. These were divided into notes on the flora and fauna, with specimens of the dialects of the Tobas, Matacos, and Chiriguanos, a description of the dress, ornaments, implements, utensils, &c., of the Tobas and Chiriguanos, anthropological details of the same tribes, an itinerary from Tarija to Asuncion, with numerous meteorological observations, and two documents belonging to the Crévaux mission. He added a study on the Peruvian and Bolivian affluents of the Amazon. With reference to the statement (recently quoted in Nature) that certain members of the mission were still alive amongst the Indians, M. Thouar stated that this information should be received with the greatest reserve, because the date to which it referred was prior to his own sojourn on the frontier, which he traversed from north to south when no one gave him any such information. Since his return to France he has received directly from Bolivia numerous communications from Dr. Gianneccini, who lives on the frontier; in these nothing is said on the subject. A monument to Dr. Crévaux is to be unveiled at Nancy on June 13.

The Geographical Society of Paris has awarded a gold medal (La Rouquette's prize) to the well-known Danish Government publication on Greenland, "Meddelelser om Grönland," in which are from time to time published the results of the Danish scientific expedition exploring that continent. The same honour has befallen Danish subjects twice before, viz. Lieut Graak, for his explorations of the east coast of Greenland; and Messrs. Bredsdorff and Olsen, for their map, "Esquisse d'une Carte orographique de l'Europe."

Geographical education in Sweden has for years left much to be desired, but of late steps have been taken for its improvement. In the so-called "Elementär-lärovarken" (classical schools) geography has hitherto been classed as an appendix to history, and at the "Lektor" (candidate) examinations in history and geography questions are only asked about the former study. And while the hours and parts of history-teaching in the schools are detailed, no such arrangement has been made as regards geography; the hours of teaching are, in some cases, even not fixed. However, at the congress of teachers held in Stockholm last year, a resolution was adopted to the effect that geography ought to form a separate study of the school education. The University of Lund is the only institution which possesses an eminent geographer for this Board of Science, viz. Baron von Schverin, who, last year, represented Sweden at the Geographical Congress in Toulouse.

The last Annual Report of the Russian Geographical Society contains extracts from letters addressed by M. Prjevalsky to the Grand Duke Alexander Alexandrovitch, which contains some further interesting details about his Hoang-ho journey. About the end of May he reached, as known, the foot of the Burkhan-budda Mountains, which inclose the high Thibet plateau separating it from Tsaidam. Leaving there his baggage, he went with only thirteen men to the sources of the Yellow River. The climbing on the 15,700 feet high passage of the Burkhan-budda ridge took three days. The descent, on the contrary, was very short, the plateau of Thibet being there 14,000 to 15,000 feet high. Further 60 miles across the desert plateau brought the traveller to the sources of the Yellow River. They are 13,600 feet above the sea-level, and consist of two rivers coming from the south and west and rising in the hills scattered on the plateau. A wide marshy valley, Odon-tala, 40 miles long and 20 miles wide, feeds numerous springs. The Hoang-ho itself is only a rivulet dividing into two or three branches, each of them but 80 to 100 feet wide, and only 2 feet deep at low water. Some 13 miles below this place the Hoang-ho enters a broad lake, colouring its southern part with its muddy water, and, after leaving it on the east, it enters again another lake, whence it flows out as a large river; further down it makes a great curve to avoid the snow-covered Amis-matchin range, and breaks through, in a wild course, the parallel ridges of the Xuen-lun. On the Thibet plateau the expedition experienced dreadful cold. In the second half of May snow-storms were as strong as in winter, and the night frosts reached -23° Celsius. Still the thin grass covering did not perish and a few flowers reappeared every day under the sun-rays. Even in June and July the thermometer fell during bright nights as low down as -5°. As to rain, it poured every day, sometimes several days without interruption. The amount of vapour brought by the south-west monsoon and deposited there is so great that, during the summer, Northern Thibet becomes an immense marsh. Needless to say that the advance was difficult for camels. Though uninhabited by man, these deserts were full of herds of yakes, khoulans, antelopes, and mountain sheep; even bears were seen in groups, sometimes of more than ten at once; some thirty pairs were shot down; they are altogether very cowardly, and fly even when wounded. After having spent a few days at the source of the Hoang-ho, M. Prjevalsky went south to the Blue River, called there Dy-tchou by the Tangoutes. The plateau remained hilly, mostly covered with marshes, where the Thibet rush, hard as iron wire, grows freely. The water-divide between the two rivers has an altitude of 14,500 feet. Further south the region takes the characters of an Alpine country, still devoid of forests, but with a richer and more varied grass vegetation. Tangoutes, of the Kam branch, were met with, and received the travellers, though not friendlily, yet not as enemies. Some 70 miles across a mountain region brought M. Prjevalsky to the Dy-tchou River, at an altitude of 12,700 feet. The river, deep and very rapid, is 350 to 420 feet wide. To ford it with camels was quite impossible, so that a further advance to the south had to be renounced. So it was decided to stay there a week and then return to explore the great lakes of the Hoang-ho. During this stay the Tangoutes fired once from the opposite bank of the Dy-tchou. Returning to the Hoang-ho, M. Prjevalsky took another route to reach the lakes of this river, finding his way without guides. The Tangoutes closely followed the party, and on July 13 suddenly attacked them. This attack, as also another one, were repulsed, and the only further difficulties were in the rains and snow-storms (end of July). On the southern foot of the Burkhan-budda Mountains a party of gold-washers was met with. They did not dig the soil deeper than one or two feet, and their washing was most primitive. Still they showed handfuls of gold, mostly in corns as large as a pea, or twice and thrice the size. After having thus laid over more than 670 miles the party returned to Tsaidam, which appeared to them, as desert as it is, a real Eldorado in comparison with the Thibet plateau.

Besides the special medals awarded to M. Woeikoff and M. N. J. Zinger, the other medals of the Russian Geographical Society have been awarded as follows:—Small gold medals to the members of the last Pamir expedition, Col. Putyata; M. Ivanoff, geologist; and M. Bendersky, topographer, as also to M. Gavriloff for a manuscript on the religious beliefs of the Votyaks, and to Prof. Zomakion for magnetic measurements at Kazan. The great gold medals were awarded this year by the Sections of Ethnography and Statistics to M. Shein for his "Materials for the Study of the Customs and Language of the Russian Population in the North-West Provinces of Russia," and to M. Yanjul on the manufactures of the Government of Moscow. Sixteen silver medals have been awarded for several papers published in the publications of the Society, for observations extended over more than ten years on thunderstorms and rainfall, to those students who helped Prof. Zomakion in his magnetic measurements, and so on.

The eccentricities of the European nomenclature of distant regions is well exemplified in the case of the eastern portion of the Indo-Chinese peninsula to which so much attention is attracted just now by the political events in progress there. On some English maps we find four separate divisions: starting from the north, Tonquin placed next to China; then Annam; then Cochin-China, and finally French Cochin-China. In the map accompanying Mr. Colquhoun's recent work, "Amongst the Shans," territory inhabited by independent tribes is inserted between Tonquin and China, which gives five divisions. This latter, however, is wholly incorrect, as the Tonquin frontier proper marches with that of China. In other maps (chiefly in those published in France) Annam and Cochin-China are thrown in together and called indifferently Annam or Cochin-China; while in others, mainly those of from ten to twenty years old, the whole coast from the Chinese frontier to the French colony of Saigon is called sometimes Cochin-China, sometimes Annam. We derive the name Cochin-China from the early navigators, who applied it to the whole coast round from Siam to China; and various generations, in search of trade rather than of geographical accuracy, have added to the confusion. Since the beginning of the present century, when the rulers of Annam imposed their yoke on Tonquin, there has been only one political power on this coast, viz. Annam. As the territories of this State stood twenty-five years ago, it was bounded by China, the Shan States, Siam, Cambodia, and the ocean, and, with the exception that France obtained three small States at the extreme south in 1861, so it stands at present. Tonquin was a feudatory State of Annam when the present war broke out. In a history of Annam recently published by Abbé Launay, a missionary in these regions, we find his title-page runs thus: "Histoire Ancienne et Moderne de l'Annam—Tong-King et Cochin-Chine—depuis, &c., &c.;" and in some interesting preliminary observations on these names, he explains that the titles Tonquin and Cochin-China are relatively recent, and are employed only by Europeans, and never by the Annamites. Tonquin comes to us from *Dong-kinh*, formerly the name of the capital, now called Hanoi; while Cochin-China comes from *Chen-chin*, the name given to the ancient State of Ciampa, situated to the extreme south of the peninsula. *Chen-chin* was probably preceded at one time by *Cao*, an abbreviation of Cao-tchi (*Giao-chi*), and from *Cao-chen-chin* Europeans have made Cochin-China. The name Annam was first given by the Chinese in the third century of our era. It was never used in the official documents between the two countries, but it is that by which the Annamites now call their country. It was at first applied to Tonquin only, but it was extended by conquest to Cochin-China, the ancient Ciampa. It should not, says Abbé Launay, be used for Cochin-China as distinct from Tonquin, but to the two united. The term *Giao-chi*, above alluded to, was that employed in the earliest epochs for the people inhabiting Annam, and was extended to the country. Their historians record that when the Emperor of China, Hoang-ti, formed the Chinese Empire in the twenty-sixth century before our era, he took Giao-chi as his boundary in the south-west. An ancient sacred book of the Chinese, the "Chou-king," which was collected in the sixth century before our era by Confucius from the remnants of still earlier works, refers to a tribe south of the Chinese frontier as the Giao-chi, which means "toes spread out," or "far apart," a term which points to a wide separation between the great toe and the others. This curious distinctive racial mark exists to-day, notwithstanding the lapse of time and the social revolutions of twenty-five or thirty centuries amongst the Annamites. We might therefore adopt the native distinctions as stated by Abbé Launay *en bloc*, and call the whole region Annam, with sub-divisions Tonquin and Cochin-China; or, making a sacrifice of strict accuracy to long habit, we might call the whole Cochin-China, with sub-divisions Tonquin and Annam. But it is probably as hopeless at present to expect strict uniformity in these names as it is to expect it in the orthography of Tonquin, although uniformity even in doing wrong would be better here than the present confusion.

AT the meeting of the Dutch Geographical Society on April 18, Mr. Robidée Van der Aa delivered a lecture on "Papuans and Melanesians, and their Relation to the Malay-Polynesian Race." Succinctly stated, the opinions expressed in the lecture were these:—The opinion once prevailed that the Papuans were the autocthones of the Malayan Archipelago, but that they were conquered by the Malays. There is, however, no support for this supposition, since in the interior of none of the Sunda Islands has a tribe been found bearing any resemblance to the Papuans. Since the researches and discoveries of Miklucho-Maclay we may not consider their hair or their dark skin as a decisive distinction with regard to other tribes. Moreover, it is now stated that their language is related to the Malayan tongue; there are still many customs and usages found amongst them similar to those met with among Malays. From all this Mr. Van der Aa concludes that the Papuans are one of five families, all of which have descended from one "insular race," and were separated from each other at an early date.

THOUGH nothing was said at the Dutch Geographical Society on April 18 about the expedition undertaken to the West Indies by Prof. Martin and Prof. Suringar, we now learn that they left Curaçoa in March. The former, accompanied by Mr. Van de Poel, arrived at Paramaribo and intended to make an excursion to the "Boven Suriname" on March 30; the latter intends to go to Venezuela, and after that to some of the Windward Islands, viz. St. Martin's, St. Eustathius, and Saba.

WE take from the Annual Report of the Russian Geographical Society the following figures giving the average temperatures for twenty-two months at the Sagastyr Polar Station at the mouth of the Lena. The following figures are on the Centigrade scale, and the first of them gives the average of the corresponding month for the year 1882–1883, while the second is the average of the same month for the year 1883–1884:—September, 0°·1 and 0°·6; October, −15°·1 and 14°·1; November, −27°·9 and −25°·7; December, −33°·5 and −33°·3; January, −37°·2 and −35°·8; February, −41°·3 and −34°·0; March, −31°·5 and −35°·2; April, −20°·7 and −21°·8; May, −8°·1 and −9°·7; June, 0°·9 and −0°·2; July, 5°·1; August, 3°·8. Average of the first year. −17°·1; of the second (incomplete), −16°·7. As seen, both years are closely similar; the exceedingly low temperatures of February, 1883, are most remarkable, the average of the month being only −41°·3, and the lowest temperature observed having been −52°·3 for the first year and −48°·0 during the second. The auroras were also less frequent, and the magnetic perturbances feebler. The number of hours during which auroras were observed is seen from the following figures:—September, 13 hours in 1882–1883, and 23 hours in 1883–1884; October, 87 and 69; November, 179 and 83; December, 191 and 178; January, 194 and 151; February, 197 and 126; March, 137 and 118; April, 10 and 8; none in May to August. Total for the first year, 1008; for the second, 756.

IT results from the same report that the delta of the Lena extends, by nearly one-half a degree, further north than on our best maps. The northern cape of the Danube (Dounay) Island is under 73° 55′ north latitude. This determination does not correspond with the Vega map, where Sagastyr, being under 73° 21′, the northern extremity of the island is under 73° 27′, and the course of the Vega in this longitude is under 74° 8′. At any rate, M. Yurgens has been compelled to go for twenty miles north of Sagastyr before reaching the extremity of the Dounay Island.

SOME EXPERIMENTS ON THE VISCOSITY OF ICE

THAT ice will change its form under the influence of pressure is exemplified at large in glaciers, and may be illustrated by experiments in the laboratory. How far this is due to a true viscosity, and how far to a rearrangement of the particles by melting and regelation, is a question the discussion of which among physicists has been of long continuance, though there there may now perhaps be some signs of permanent yielding under the influence of continuous pressure.

In the first volume of NATURE (p. 534) Mr. Wm. Matthews describes experiments (1870) in which planks of ice, supported at each end, but free in the middle, become permanently bent. In the first of these experiments the plank was 6 inches wide, 2⅝ inches thick, and supported by bearers 6 feet apart. The temperature of the air was above the freezing-point of water. The plank bent rapidly, so that the total deflection was 7 inches in about as many hours. "At its lowest point it appeared bent at a sharp angle, and was rigid in its altered form." Its lower surface showed minute fissures. In a second experiment a plank of somewhat similar dimensions (1⅞ inch thick, 6¼ to 6½ inches wide, 6 feet between the supports) became permanently bent. The amount of deflection was 3⅝ for the upper surface and 3⅛ for the lower surface. The time was 64½ hours. The temperature "never rose above the freezing-point"; but the fact that the thermometer registered 29°·5 F. one morning at 9·30 a.m., and 30° F. the next morning at the same time, would lead us to suppose that the midday temperature was not far from the freezing-point. Similar experiments were subsequently carried out (1871) by Prof. Tyndall, in Switzerland, and are mentioned in NATURE (vol. iv. p. 447).

In NATURE, vol. vi. p. 396, Mr. John Aitken describes experiments in which weighted shillings were caused to sink into blocks of ice. But when the block of ice was previously cooled to about 1° below the freezing-point, a shilling weighted with 90 lbs. and left for three and a half hours, "was found not to have entered in the slightest degree into the ice." Subsequently, in 1873 (NATURE, vol. vii. p. 287), Mr. Aitken described experiments which showed that ice bends the more readily the more air-bubbles it contains. "Temperature," he says, "seemed to have some influence on the rate of bending of these beams, but this point was difficult to determine on account of the different beams bending at different rates at the same temperature; but, so far as could be ascertained from the experiments, the beams bent slower the lower the temperature. The lowest temperature used in these experiments was rather more than 3° F. below freezing."

In 1875 Prof. Pfaff described in *Poggendorff's Annalen* (civ. p. 169, reported in NATURE, vol. xii. p. 317) a carefully conducted experiment in which a paralellopiped of ice 52 cm. long, 2·5 cm. wide, and 1·3 cm. thick, was supported in such a way that 5 mm. at each end rested on the bearers. This was left for seven days, from February 8 to February 15, the temperature varying between −12° and −3·5° C. The total bend was 11·5 mm. That is to say, to translate these measurements into inches for the sake of comparison with the other results, in a bar 20 inches in length between the supports, 1 inch in width, and ½ inch in thickness; the total bending was a little over ·45 of an inch. When the temperature rose to slightly under 0° C. the bending increased, and amounted to 9 mm. (·34 inches) in 24 hours. Other experiments are described by Prof. Pfaff in the same paper, and the general conclusion to which he is led is, "that even the smallest pressure is sufficient to dislocate ice-particles if it act continuously, and if the temperature of the ice and its surroundings be near the melting point."

In the current volume of NATURE (p. 329) there is a report of a paper recently read before the Royal Society by Mr. Coutts Trotter (to whom I am indebted for references on this subject) "On some physical properties of ice, &c.," in which were described some experiments on the shearing of ice, carried out in a glacier grotto at a nearly uniform temperature of about 0° C. In that report we learn that in the paper itself "reasons are given for supposing that the range of temperature through which ice is sensibly viscous is small."

So far as I know no experiments on the viscosity of ice at very low temperatures have been recorded. It is the object of the present communication to describe some such experiments which I have recently conducted, through the kindness and courtesy of Messrs. J. S. Fry and Sons, of Bristol, in the snow chamber of the refrigerator, at their well-known Cocoa Works.